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US DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NO.

H 2849 PCT/US

TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371

U.S. APPLICATION NO. (if known, sec. 17 CFR 1.5)

09/402232

INTERNATIONAL APPLICATION NO.
PCT/EP98/01851INTERNATIONAL FILING DATE
March 30, 1998PRIORITY DATE CLAIMED
April 07, 1997

TITLE OF INVENTION

PROCESS FOR PREPARING ALKYL AND/OR ALKENYL OLIGOGLYCOSIDES

APPLICANT(S) FOR DO/EO/US

Rainer ESKUCHEN, Eiko HASSE and Bernhard GUTSCHE

Applicant herewith submits to the United States Designated/Elected Office (EO/DO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
 2. ☐ This a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
 3. ☐ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
 4. ☒ A proper Demand for International Preliminary Examination was made by the 19th month from the earliest claimed priority date.
 5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☐ is transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
 6. ☒ A translation of the International Application into English (35 U.S.C. 371(c)(2)).
 7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3))
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
 8. ☐ A translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
 9. ☒ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
 10. ☐ A translation of the annexes to the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).
- Items 11. to 16. below concern other document(s) or information included:
11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98.
 12. ☒ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
 13. ☒ A FIRST preliminary amendment
 ☐ A SECOND or SUBSEQUENT preliminary amendment.
 14. ☐ A substitute specification.
 15. ☐ A change of power of attorney and/or address letter.
 16. ☒ Other items or information.:

International Search Report (With Information Disclosure Citation and References)

"Express Mail" mailing label number EL 444424185 US

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CALCULATIONS **PTO USE ONLY**

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- a. ☐ A check in the amount of \$_____ to cover the above fees is enclosed.
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A triplicate copy of this sheet is enclosed. Order No. 99-1195.
- c. ☒ The Assistant Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 01-1250. A triplicate copy of this sheet is enclosed.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137 (a) or (b)) must be filed with the application to pending status.

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2500 Renaissance Blvd, Suite 200
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36.296
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514 Rec'd PCT/PTO 30 SEP 1999

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PATENT
Docket H 2849 PCT/US

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Re: PCT/EP98/01851

International Filing Date: March 30, 1998
Priority Date Claimed: April 7, 1997
Applicant: ESKUCHEN, et al.
Title: THE PROCESS FOR PREPARING
ALKYL AND/OR ALKENYL
OLIGOGLYCOSIDES
Applicants' Reference: H 2849 PCT/US

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Box PCT
Washington, DC 20231

Attn: DO/EO/US

Sir:

Preliminary to examination, please amend the instant application as follows.

IN THE SPECIFICATION:

At page 1, line 1, delete "Field of the Invention", and insert
--BACKGROUND OF THE INVENTION--.

At page 1, line 5, delete "Prior Art".

At page 2, line 30, delete "whch", and insert --which--.

Enter a new page 9, submitted herewith, containing the
Abstract of the Disclosure

Preliminary Amendment of U.S. National Stage for International
Application PCT/EP98/01851 filed March 30, 1998

IN THE CLAIMS:

Cancel claims 1-10, without prejudice.

Please enter the following new claims.

11. A process for making alkyl and/or alkenyl oligoglycosides comprising:

- (a) providing a glucose sirup;
- (b) providing a fatty alcohol;
- (c) combining the glucose sirup with the fatty alcohol in order to form a glucose sirup/fatty alcohol suspension;
- (d) providing an acidic catalyst;
- (e) adding the acidic catalyst to the glucose sirup/fatty alcohol suspension; and
- (f) acetalizing the glucose sirup/fatty alcohol suspension containing the acidic catalyst to form the alkyl and/or alkenyl oligoglycosides.

12. The process of claim 11 wherein the glucose sirup has a solids content of from 50 to 85% by weight, based on the weight of the glucose sirup.

13. The process of claim 11 wherein the glucose sirup has a monomeric glucose content of from 80 to 99.9% by weight, based on the weight of the glucose sirup.

14. The process of claim 11 wherein the glucose sirup of (a) is in supercooled melt form.

**Preliminary Amendment of U.S. National Stage for International
Application PCT/EP98/01851 filed March 30, 1998**

15. The process of claim 11 wherein the fatty alcohol of (b) is preheated to a temperature of from 25 to 40°C.

16. The process of claim 11 wherein the fatty alcohol corresponds to formula (I):



wherein R¹ is an aliphatic, linear or branched hydrocarbon radical having from 6 to 22 carbon atoms, and up to 3 double bonds.

17. The process of claim 11 wherein the glucose sirup and fatty alcohol are combined in a molar ratio of from 1:1 to 1:10.

18. The process of claim 11 wherein the catalyst is added to the glucose sirup/fatty alcohol suspension in an amount of from 0.1 to 5% by weight, based on the weight of the suspension.

19. The process of claim 11 wherein the process is carried out discontinuously in a stirred tank reactor.

20. The process of claim 11 wherein the process is carried out in a cascade of from 3 to 6 stirred reactors.

21. The process of claim 11 wherein the glucose sirup/fatty alcohol suspension is dried prior to acetalization.

22. The process of claim 20 wherein the cascade of stirred

**Preliminary Amendment of U.S. National Stage for International
Application PCT/EP98/01851 filed March 30, 1998**

reactors has a temperature gradient of from 70 to 120°C.

23. The process of claim 20 wherein the cascade of stirred reactors has a pressure gradient of from 20 to 50 mbar.

24. The process of claim 11 wherein acetalization is carried out under reduced pressure.

Respectfully submitted,



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SJT/lmd

Attachment: Abstract of the Disclosure

Abstract of the Disclosure

A process for making alkyl and/or alkenyl oligoglycosides involving: (a) providing a glucose sirup; (b) providing a fatty alcohol; (c) combining the glucose sirup with the fatty alcohol in order to form a glucose sirup/fatty alcohol suspension; (d) providing an acidic catalyst; (e) adding the acidic catalyst to the glucose sirup/fatty alcohol suspension; and (f) acetalizing the glucose sirup/fatty alcohol suspension containing the acidic catalyst to form the alkyl and/or alkenyl oligoglycosides.

Process for Preparing Alkyl and/or Alkenyl Oligoglycosides

Field of the invention

This invention relates to a process for the acidic acetalization of glycoses with excess fatty alcohols using glucose sirup.

5 Prior Art

Alkyl glucosides are important nonionic surfactants which have been adopted for use in manual dishwashing detergents and cosmetic preparations by virtue of their behavior, which in many cases corresponds to that of anionic surfactants, and their excellent ecological and dermatological properties. They can be produced by subjecting glucose or glucose sirup to acidic acetalization with an excess of higher alcohols, optionally via the intermediate stage of butyl glucosides. Corresponding industrial processes go back to the years 1968/70 [cf. **US 3,547,828**, **US 3,839,318** (Rohm & Haas)]. The glucosides are normally produced discontinuously from solid glycoses, such as glucose monohydrate for example, in a stirred tank reactor with subsequent evaporation of the fatty alcohol. However, there has hitherto been no shortage of processes designed for continuous acetalization, for example using thin-layer evaporators [**EP-A1 0501032** (Hüls), **DE-A1 4231833** (Henkel)] or countercurrent reaction columns [**EP-A1 0482325**, **EP-A1 0514627** (Hüls)]. These processes presuppose the use of glucose sirup together with butanol because otherwise incrustation, caking and large amounts of unreacted glucose can readily occur. Unfortunately, the route involving the formation of butyl glucosides as intermediate products, which have to be subsequently reacted with fatty alcohols to form the end products, is complicated and therefore undesirable.

The problem addressed by the present invention was to provide a new process for the direct acidic acetalization of glucose sirup with fatty alcohols which would involve the use of butanol. Preferably, the process would lend itself to continuous operation.

5

Description of the Invention

The present invention relates to a process for the production of alkyl and/or alkenyl oligoglycosides by direct acidic acetalization of glycoses with excess fatty alcohols, characterized in that suspensions of glucose sirup in fatty alcohols are used.

It has surprisingly been found that even water-containing glucose sirup can readily be acetalized with fatty alcohols both discontinuously and continuously without any need to resort to the intermediate stage of butyl glucosides, providing the glucose sirup is used in the form of a suspension in fatty alcohols.

15

Glucose sirup

In the context of the present invention, the term "glucose sirup" is intended to apply to preferably refined aqueous solutions of D-glucose, maltose and higher polymers of glucose, for example oligosaccharides or dextrans, which can generally be produced by acidic hydrolysis and/or by enzymatic degradation of starch. Glucose sirups with a solids content of 50 to 85% by weight and, more particularly, 75 to 80% by weight and a DP1 degree (monomeric glucose content) of 80 to 99.9% by weight and, more particularly, 94 to 99.5% by weight, based on the solids, are particularly preferred.

20

25

Suspensions of glucose sirup in fatty alcohols

To use glucose sirup, it has to be converted before acetalization into a form which makes it easier to handle and which, in particular, prevents

30

decomposition occurring in the course of the reaction. To this end, it is advisable to preheat fatty alcohol to a temperature of 25 to 40°C and to disperse the molten glucose sirup in the preheated fatty alcohol with vigorous stirring or with the aid of an inline mixer. In a particularly preferred embodiment, the glucose sirup is added to the fatty alcohol as a supercooled melt. In one alternative process, solid glucose sirup can even be dispersed. The temperature in the slurry tank should not exceed 45°C. Under the conditions mentioned, the glucose sirup precipitates as a solid and a stable glucose sirup/fatty alcohol suspension which can readily be used for the direct acetalization is formed. Accordingly, the present invention also relates to the use of suspensions of glucose sirup and fatty alcohols as raw materials for the production of alkyl and/or alkenyl oligoglycosides.

15 Fatty alcohols

Fatty alcohols in the context of the present invention are primary aliphatic alcohols corresponding to formula (I)



(I)

20 in which R^1 is an aliphatic, linear or branched hydrocarbon radical containing 6 to 22 carbon atoms and 0 and/or 1, 2 or 3 double bonds. Typical examples are caproic alcohol, caprylic alcohol, 2-ethylhexyl alcohol, capric alcohol, lauryl alcohol, isotridecyl alcohol, myristyl alcohol, cetyl alcohol, palmitoleyl alcohol, stearyl alcohol, isostearyl alcohol, oleyl alcohol, elaidyl alcohol, petroselinyl alcohol, linolyl alcohol, linolenyl alcohol, elaeostearyl alcohol, arachyl alcohol, gadoleyl alcohol, behenyl alcohol, erucyl alcohol and brassidyl alcohol and the technical mixtures thereof obtained, for example, in the high-pressure hydrogenation of
30 technical methyl esters based on fats and oils or aldehydes from Roelen's

oxosynthesis and as monomer fraction in the dimerization of unsaturated fatty alcohols. Technical fatty alcohols containing 8 to 18 carbon atoms, for example cocofatty alcohol, palm oil fatty alcohol, palm kernel oil fatty alcohol or tallow fatty alcohol, are preferred. The glycoses and the fatty
5 alcohols are used in a molar ratio of preferably 1:1 to 1:5 and, more preferably, 1:2 to 1:3. In these ratios, the reaction components give glycosides which have a DP of 1.0 to 1.8 and preferably 1.3 to 1.7.

Catalysts

10 Basically, the choice of the acidic catalysts is not critical. So far as product color, foaming during acetalization, yield and the required average degree of polymerization (DP) are concerned, it has proved to be of particular advantage to use alkyl benzenesulfonic acids such as, for example, p-toluene sulfonic acid or dodecyl benzenesulfonic acid. The
15 catalysts may be used as solutions in water or the fatty alcohols, in which case the catalyst content can be from 10 to 80% by weight. Typical catalyst contents in water are 50 to 80% by weight and, in fatty alcohols, 60 to 90% by weight. The catalysts are preferably used in quantities of 0.1 to 5% by weight and more preferably in quantities of 1 to 3% by weight, based
20 on the starting materials.

Acetalization

The acetalization reaction can be carried out discontinuously in a stirred tank reactor. In one preferred embodiment of the invention,
25 however, the acetalization is carried out in a cascade of 3 to 6 and preferably 3 to 4 stirred reactors. The expression "direct acetalization" means that glucose sirup and fatty alcohol are directly reacted to give the target products. In other words, the acetalization is not preceded, for example, by the preparation of a lower alkyl glycoside which then has to be
30 trans-acetalized with the fatty alcohol. It is advisable to dry the glucose

- 5 sirup/fatty alcohol suspension before the acetalization reaction. This can be done, for example, by designing the first reactor of the cascade as a drying stage because the presence of water in the mixture can lead to an unwanted increase in the polysugar content of the end product and to caking on the walls of the reactor. Basically, drying can be carried out both in batches and continuously. In batch drying, the temperature should be increased in steps whereas, in continuous drying, the addition of the glucose sirup/fatty alcohol slurry should preferably be adjusted in such a way that the water content in the drying reactor is below 0.5% by weight.
- 10 Since a uniformly high temperature in the reaction stage can also lead to an increase in the polysugar content, it is also advisable to use a reactor cascade and to apply a temperature gradient of 70 to 120°C and/or to carry out the reaction under reduced pressure. A pressure gradient of, for example, 20 to 50 mbar may also be applied or, alternatively, different catalyst concentrations may be adjusted in the individual reactors. On completion of the acetalization reaction, it is advisable to neutralize the reaction products by addition of aqueous bases, for example sodium hydroxide and/or magnesium oxide, before the excess fatty alcohol is removed in known manner by distillation.
- 15
- 20 If necessary, however, fatty alcohol may also be added in addition to the fatty alcohol added as a suspension containing the glucose sirup.

Examples

- 25 **Preparation of the glucose sirup/fatty alcohol suspension.** In a stirred tank reactor, cocofatty alcohol was heated to 40°C and mixed with vigorous stirring with glucose sirup, the temperature being kept below 45°C and the glucose sirup being added as a supercooled melt at 30°C. The glucose sirup was precipitated as a solid and was processed in situ to a glucose sirup/fatty alcohol suspension.
- 30

Example 1. 454 g of the suspension were introduced into a 1 liter stirred reactor, heated for 1 hour at 35 mbar to 75°C and dried. The catalyst solution was then added, the mixture was heated to the reaction temperature and was kept at that temperature until the residual glucose content had fallen to 0.75% by weight.

Example 2. 454 g of the suspension were introduced into the drying reactor R1 of a reactor cascade consisting of four 1-liter glass reactors and dried as described in Example 1. The other reactors were filled with fatty alcohol. The reactors were thermostatted by circulation thermostats containing heat transfer oil. A rotary slide-valve oil pump was used as the vacuum pump. The catalyst solution was introduced into reactor R2 by another pump. The reaction mixture flowed from reactor R4 into a receiving flask in which it was neutralized with aqueous sodium hydroxide solution (25% by weight).

The test data and results of the two Examples are set out in Table 1.

Table 1

Production of alkyl glucosides

	1 (quantities in g)	2 (quantities in g/h)
Glucose sirup (70% by weight)	114	114
Cocofatty alcohol	340	340
Dodecyl benzenesulfonic acid*	1.1	1.1
Number of reactors (total)	1	4
Pressure [mbar]	35	35
Temperature R1 [°C]	105	75
Temperature R2 [°C]	-	105
Temperature R3 [°C]	-	105
Temperature R4 [°C]	-	105
Residual glucose in the product [%]	0.75	0.5

	1 (quantities in g)	2 (quantities in g/h)
by weight]		
Polymer content in the product [% by weight]	3.6	3.2
DP**	1.42	1.42

*) 70% by weight in cocofatty alcohol, **) degree of polymerization

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CLAIMS

1. A process for the production of alkyl and/or alkenyl oligoglycosides by direct acidic acetalization of glycoses with excess fatty alcohols, characterized in that suspensions of glucose sirup in fatty alcohol are used.
- 5 2. A process as claimed in claim 1, characterized in that fatty alcohols corresponding to formula (I):

R¹OH**(I)**

- 10 in which R¹ is an aliphatic, linear or branched hydrocarbon radical containing 6 to 22 carbon atoms and 0 and/or 1, 2 or 3 double bonds are used.
3. A process as claimed in claims 1 and 2, characterized in that the glucose sirup and the fatty alcohols are used in a molar ratio of 1:1 to 1:10.
- 15 4. A process as claimed in claims 1 to 3, characterized in that alkyl benzenesulfonic acids are used as catalysts.
5. A process as claimed in claims 1 to 4, characterized in that the catalysts are used in quantities of 0.1 to 5% by weight, based on the starting materials.
- 20 6. A process as claimed in claims 1 to 5, characterized in that the acetalization is carried out continuously in a cascade of 3 to 6 reactors.
7. A process as claimed in claim 6, characterized in that a temperature gradient of 70 to 120°C is applied to the reactor cascade for the acetalization reaction.
- 25 8. A process as claimed in claims 1 to 7, characterized in that the reaction is carried out under reduced pressure.
9. A process as claimed in claims 1 to 8, characterized in that the glucose sirup is dried before the acetalization reaction.
10. The use of suspensions of glucose sirup and fatty alcohols as raw
- 30 materials for the production of alkyl and/or alkenyl oligoglycosides.

Type a plus sign (+) inside this box → ☐0010/PTO
Rev. 6/95U.S. Department of Commerce
Patent and Trademark Office**DECLARATION FOR
UTILITY OR DESIGN
PATENT APPLICATION**☒ Declaration Submitted with Initial Filing OR ☐ Declaration Submitted after Initial FilingAttorney Docket
Number

H 2849 PCT/US

First Named
Inventor

ESKUCHEN, Rainer

COMPLETE IF KNOWN

Application Number

Filing Date

Group Art Unit

Examiner Name

As a below named inventor, I hereby declare that:

My residence, post office address, and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

PROCESS FOR PREPARING ALKYL AND/OR ALKENYL OLIGOGLYCOSIDES

the specification of which

(Title of the Invention)

☐ is attached hereto

OR

☒ was filed on (MM/DD/YYYY) 03/30/1998 as United States Application Number or PCT InternationalApplication Number PCT/EP98/01851 and was amended on (MM/DD/YYYY) (if applicable).

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment specifically referred to above

I acknowledge the duty to disclose information which is material to patentability as defined in Title 37 Code of Federal Regulations, § 1.56

I hereby claim foreign priority benefits under Title 35, United States Code §119(a)-(d) or §365(b) of any foreign application(s) for patent or inventor's certificate, or §365(a) of any PCT International application which designated at least one country other than the United States of America, listed below and have also identified below, by checking the box, any foreign application for patent or inventor's certificate, or of any PCT International application having a filing date before that of the application on which priority is claimed

Prior Foreign Application Number(s)	Country	Foreign Filing Date (MM/DD/YYYY)	Priority Not Claimed	Certified Copy Attached? YES NO
197 14 255.9	Germany	04/07/1997	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>	<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input checked="" type="checkbox"/>

☐ Additional foreign application numbers are listed on a supplemental priority sheet attached hereto:

I hereby claim the benefit under Title 35, United States Code §119(e) of any United States provisional application(s) listed below.

Application Number(s)	Filing Date (MM/DD/YYYY)	Additional provisional application numbers are listed on a supplemental priority sheet attached hereto.
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

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DECLARATION

Page 2

I hereby claim the benefit under Title 35, United States Code §120 of any United States application(s), or §365(c) of any PCT international application designating the United States of America, listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States or PCT international application in the manner provided by the first paragraph of Title 35, United States Code §112.1 acknowledge the duty to disclose information which is material to patentability as defined in Title 37, Code of Federal Regulations §1.56 which became available between the filing date of the prior application and the national or PCT international filing date of this application.

U.S. Parent Application Number	PCT Parent Number	Parent Filing Date (MM/DD/YYYY)	Parent Patent Number (if applicable)
	PCT/EP98/01851	03/30/1998	

☐ Additional U.S. or PCT international application numbers are listed on a supplemental priority sheet attached hereto

As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

☐ Firm Name Customer Number or label

☒ List Attorney(s) and/or agent(s) name and registration number below:

Name	Registration Number	Name	Registration Number
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Wayne C. Jaeschke	21,062	Stephen D. Harper	33,243
John E. Drach	32,891	Steven J. Trzaska	36,296

☐ Additional attorney(s) and/or agent(s) named on a supplemental sheet attached hereto.

Please direct all correspondence to: ☐ Customer Number or label OR ☒ Fill in correspondence address below

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City Gulph Mills State PA ZIP 19406
Country USA Telephone 610-278-4920 Fax 610-278-6548

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Name of Sole or First Inventor: ☐ A petition has been filed for this unsigned

Given Name Rainer Middle Initial Family Name ESKUCHEN Suffix e.g. Jr.

Inventor's Signature Rainer ESKUCHEN Date Sept. 28, 99

Residence: City Langenfeld State Country Germany Citizenship Germany

Post Office Address Alt Langenfeld 42

Post Office Address

City 40764 Langenfeld State Zip Country Germany Applicant Authority

☒ Additional inventors are being named on supplemental sheet(s) attached hereto

DECLARATION										ADDITIONAL INVENTOR(S) Supplemental Sheet			
Name of Additional Joint Inventor, if any:										<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name	Eiko				Middle Initial		Family Name	HASSE		Suffix e.g. Jr.			
Inventor's Signature	<i>Eiko Hasse</i>						Date	Sept. 28, 99					
Residence: City	Duesseldorf				State		Country	Germany		Citizenship	Germany		
Post Office Address	Am Falder 101												
Post Office Address													
City	40589 Duesseldorf				State		Zip		Country	Germany		Applicant Authority	
Name of Additional Joint Inventor, if any:										<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name	Bernhard				Middle Initial		Family Name	GUTSCHE		Suffix e.g. Jr.			
Inventor's Signature	<i>Bernhard Gutsche</i>						Date	Sept. 28, 99					
Residence: City	Hilden				State		Country	Germany		Citizenship	Germany		
Post Office Address	Kalstert 96												
Post Office Address													
City	40724 Hilden				State		Zip		Country	Germany		Applicant Authority	
Name of Additional Joint Inventor, if any:										<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name					Middle Initial		Family Name			Suffix e.g. Jr.			
Inventor's Signature							Date						
Residence: City					State		Country			Citizenship			
Post Office Address													
Post Office Address													
City					State		Zip		Country			Applicant Authority	
Name of Additional Joint Inventor, if any:										<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name					Middle Initial		Family Name			Suffix e.g. Jr.			
Inventor's Signature							Date						
Residence: City					State		Country			Citizenship			
Post Office Address													
Post Office Address													
City					State		Zip		Country			Applicant Authority	
Name of Additional Joint Inventor, if any:										<input type="checkbox"/> A petition has been filed for this unsigned inventor			
Given Name					Middle Initial		Family Name			Suffix e.g. Jr.			
Inventor's Signature							Date						
Residence: City					State		Country			Citizenship			
Post Office Address													
Post Office Address													
City					State		Zip		Country			Applicant Authority	
<input type="checkbox"/> Additional inventors are being named on supplemental sheet(s) attached hereto													